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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SAYOC, EMMANUEL	
ART UNIT	**PAPER NUMBER**
3746	

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

Office Action Summary	Application No.	Applicant(s)	
	10/806,087	RAJENDRAN ET AL.	
	Examiner	Art Unit	
	Emmanuel Sayoc	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *04 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-74* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-74* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendments of 8/04/2005. In making the below rejections and/or objections the examiner has considered and addressed each of the applicants' arguments. Claims 1-74 are pending and are under current consideration. Claim 30 is amended. Claims 73, and 74 are newly added.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doepker et al. (U.S. 6,213,731 B1) and Suefuji et al. (U.S. 6,267,572 B1).

Doepker et al. in Figure 1, teaches a scroll compressor unit comprising an outer shell (12) defining a first suction pressure zone (44), and a first discharge pressure zone (42). A first scroll compressor (26, 32) is in fluid communication with the discharge pressure zone (42), and is disposed within the suction pressure zone of the shell (44). The first scroll compressor (26, 32) includes a first non-orbiting scroll member (32) interleaved with a first orbiting scroll member (26), the first orbiting scroll member (22a) is mounted for radial movement within the outer shell (12). A motor (14, 16) is disposed within the suction pressure zone (44) in shell (12), and is drivingly coupled to the drive shaft (18). As the electric motor (14, 16) speed depends on power input, the motor (14, 16) constitutes a variable speed motor.

Mounting frames (220, 214, 222, Figure 5) are placed to support the motor (14, 16), with its stator, rotor, and shaft (18).

The Doepker et al. device differs from the claimed invention in that there is no teaching of the compressor comprising a second scroll compressor in the suction pressure zone similar to the configuration of the first compressor and driven by a common motor. This dual scroll compressor and common motor was well known in the art at the time the invention was made. Suefuji et al. in Figure 1, teaches a dual scroll compressor unit comprising a first scroll compressor (4a, 22a) and a second scroll compressor (4b, 22b) driven by a common motor (9, 10) and a drive shaft (21) operable

to drive said first (4a, 22a) and second (4b, 22b) scroll compressors for compressing fluid disposed within said suction pressure zone. This configuration allows for increased compressor capacity. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Doepker et al. device by incorporating the dual scroll compressor and common motor configuration as taught by Suefuji et al., in order to achieve increased compressor capacity. In the combination it would have been further obvious to preserve the compressor configuration as taught by Doepker et al.

In the dual compressor combination, a second scroll compressor (similar to the first) is in fluid communication with the discharge pressure zone (42), and is disposed within the suction pressure zone (44) of said shell (12), and the second scroll compressor (similar to the first) includes a second non-orbiting scroll member (similar to the first) interleaved with a second orbiting scroll member (similar to the first). The second orbiting scroll member (similar to the first) is mounted for radial movement within said outer shell (2).

5. Claims 1-29, and 31-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doepker et al., as modified by Suefuji et al., as applied to related structure in the rejection of claim 30, and in further view of Osada et al. (JP 10-037866).

As outlined above, Doepker et al., as modified by Suefuji et al., teach a device substantially analogous to the claimed invention.

Furthermore, in the combination, and in reference to Figure 1 of Doepker et al. (all embodiments are in reference to Doepker et al. unless otherwise specified), the first scroll compressor comprises a first scroll member (26, 32) having a first end plate (Figure 1 shown not enumerated) and a first spiral wrap (Figure 1 shown not enumerated) extending therefrom, and a second scroll member (32) having a second end plate (Figure 1 shown not enumerated) and a second spiral wrap (Figure 1 shown not enumerated) extending therefrom. The first (Figure 1 shown not enumerated) and second (Figure 1 shown not enumerated) scroll members are positioned with the first (Figure 1 shown not enumerated) and second (Figure 1 shown not enumerated) spiral wraps interleaved with each other. A second scroll compressor (similar to the first scroll compressor) is disposed within said suction pressure zone (44) of said shell (12). The second scroll compressor comprises a third scroll member (similar to the corresponding component in the first scroll compressor) having a third end plate (similar to the corresponding component in the first scroll compressor) and a third spiral wrap (similar to the corresponding component in the first scroll compressor) extending therefrom. A fourth scroll member (similar to the corresponding component in the first scroll compressor) has a fourth end plate (similar to the corresponding component in the first scroll compressor) and a fourth spiral wrap (similar to the corresponding component in the first scroll compressor) extending therefrom. The third (similar to the corresponding component in the first scroll compressor) and fourth (similar to the corresponding

component in the first scroll compressor) scroll members are positioned with the third (similar to the corresponding component in the first scroll compressor) and fourth (similar to the corresponding component in the first scroll compressor) spiral wraps interleaved with each other. A drive shaft (18) extends between and coupled to each of said first (similar to the corresponding component in the first scroll compressor) and third (similar to the corresponding component in the first scroll compressor) scroll members. The drive shaft (18) is operable to drive the first (26, 32) and second (similar to the first scroll compressor) scroll compressors for compressing fluid disposed within the suction pressure zone. In the combination, the drive shaft would have extended between and would have coupled each of said first and second orbiting scroll members, and the drive shaft (18) would have been operable to drive said first and second scroll compressors for compressing fluid disposed within said suction pressure zone. The Doepker et al. device includes a main bearing housing (20, 26, 30) on each scroll compressor attached to the mounting frames (20) on each end of the compressor. The outlets (shown not enumerated) are connected to first and second discharge chambers (42, one on each scroll compressor) of the scroll compressors. The mounting frame (20) is disposed between the first main bearing (30) and the shell (12). The same would apply for the second scroll compressor bearing and mounting configurations.

In the combination outlined above, the shaft (18) ends have an eccentric section, protruding tip (28) which constitutes a pin, eccentrically offset from the central axis of the shaft (18) thus defining a pin axis eccentrically offset from the central axis of the

shaft (18). This would be the case for both ends of the drive shaft, which drive the first and second scroll compressors.

In Doepker et al. a suction inlet (46) is in communication with the suction pressure zone. The compressor is reversible allowing suction or discharge through any given port.

The cylindrical shell (12) has two end caps (Figure 5) connected on either side of the shell (12).

With respect to welding, in MPEP 2173, Product-by-Process Claims, the determination of patentability is based on the product itself (not the process). The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior-art, the claim is unpatentable even though the prior-art product was made by a different process.

Sealing surfaces (wrap engagement to end walls) of said first (26, 32) and second (similar to the first scroll compressor) scroll members are in sealing relationship to close off first fluid pockets (compression chambers).

Doepker et al. teaches that it was well known to adjust the axial engagement of the fixed scroll relative to the orbiting scroll in order to control leakage between the engaging wraps and the end plates, thus modulating the capacity of the scroll compressor. Doepker et al., in Figures 1 and 2, teach a scroll compressor with an orbiting scroll and end plate assembly (26) and a fixed scroll and end plate assembly (32). The fixed scroll (32) is actuated axially to control the capacity or to unload the

compressor – see column 2 line 3 to 24, and column 3 line 64 to column 5 line 56. Sealing surfaces (wrap engagement to end walls) of said first (26) and second (32) scroll members are in sealing relationship to close off first fluid pockets (compression chambers). The second scroll member (32) is being movable between a first relationship (Figure 1) in which sealing surfaces of said first (26) and second (32) scroll members are in sealing relationship to close off first fluid pockets, and a second relationship (Figure 2) wherein at least one of said sealing surfaces of said first (26) and second (32) scroll members are spaced apart to define a first leakage path between said first fluid pockets. Furthermore a first fluid operated piston (70) is secured to said second scroll member (32), where said first fluid operated piston (70) being actuatable to apply a force to said second scroll member (32) to move said second scroll member (32) between said first relationship (Figure 1) where said first scroll compressor operates at substantially full capacity and said second relationship (Figure 2) where said first scroll compressor operates at substantially zero capacity. The Doepker et al. capacity modulation system uses a pulse width modulated system (column 3 line 10, and column 5 line 7-26) to operate a solenoid valve (74), which in turn regulates discharge and suction pressures that actuate the piston (74). Pulse width modulation constitutes operation on a time pulsed manner. It would have been further obvious to apply the same modulation system to the second scroll compressor in the combination above such that all modulation components, such as the fluid operated piston are reproduced in the second compressor.

In the combination set forth above, the chamber (92 Doepker et al.) constitutes a fluid pressure chamber operative to apply an axial force on the piston (70). Furthermore, in Doepker et al. the first passage (94) supplies fluid to the chamber (92). The passage (98) serves to vent the pressure chamber (94).

The Doepker et al. suction port (46) extending through the outer shell (12) introduces fluid into the compressor shell (12). It is evident that a suction port can be provided for each scroll compressor as seen in Figure 1, or a single suction port for supplying fluid to both screw compressors. Each scroll compression chamber has a compression chamber inlet (28), one for each compressor, which constitutes first and second fluid injection fittings for implementing a first and second vapor injection system for the first (26, 32) and second (similar to the first compressor) scroll compressors. The suction port (46) and inlets (28) components constitute fluid injection fitting, because it is through these fitting that fluid is injected into the compressor.

The outer shell (12) of Doepker et al., is cylindrical. The Doepker et al., as modified by Suefuji et al. device differs from the claimed invention in that there is no explicit teaching of the compressor comprising an oil sump disposed along a cylindrical sidewall of the outer shell. Although there is no explicit teaching of an oil sump, it is evident that one exists in Doepker et al., - see oil passages within the shaft (18). In any case, it was well known in the art to use oil to lubricate the bearings and moving components of a compressor. Osada et al. in Figure 1, teach that it was well known in the art to supply an oil sump with associated oil pumps to the scroll compressors to provide lubrication. Therefore it would have been obvious to one of ordinary skill in the

art at time the invention was made to further modify the Doepker et al., as modified by Suefuji et al. device by incorporating the oil sump, as taught by Osada et al., in order to provide compressor lubrication. The Doepker et al. shaft (18) includes fluid passages therein, see axial and radial passages within shaft (18). It is evident that the rotation of the shaft causes the intake of oil lubricant within the shaft through the radial passages, thus constituting first and second oil pumps.

Response to Arguments

6. Applicant's arguments with respect to claims 1-74 have been considered but are moot in view of the new ground(s) of rejection.

A rejection of Doepker et al. as modified by Suefuji et al. has been formulated to read upon the claimed invention.

Since new grounds of rejection have been made, this office action is being made non-final to afford the applicant the opportunity to respond to the new grounds of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to scroll compressors.

U.S. Pat. 5,741,120 to Bass et al.

U.S. Pat. 5,609,478 to Utter et al.

Japanese Pat. 02-11882 to Onoda et al.

Japanese Pat. 404121478 A to Nagatomo et al.

Japanese Pat. 406002670 A to Tsubono et al.

Japanese Pat. 404121474 A to Nagatomo et al.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Sayoc whose telephone number is (571) 272 4832. The examiner can normally be reached on M-F 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on (571) 272-4444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Sayoc
Examiner
Art Unit 3746

ECS